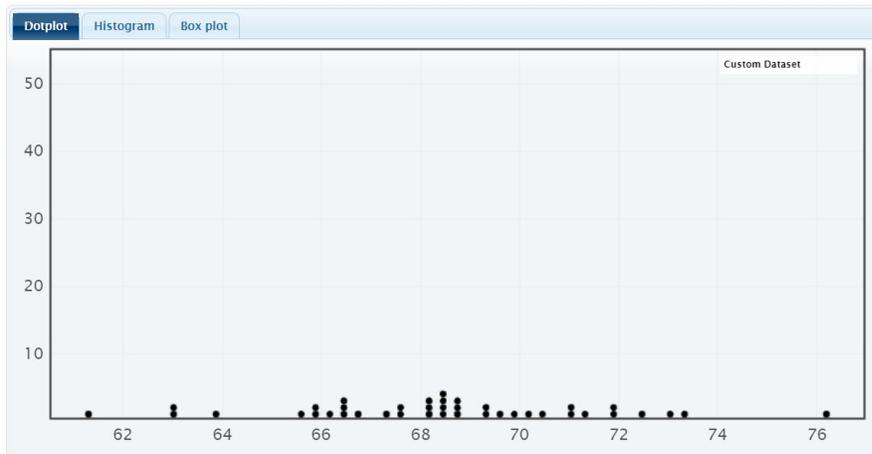


Stat Support Activity: Normally Distributed

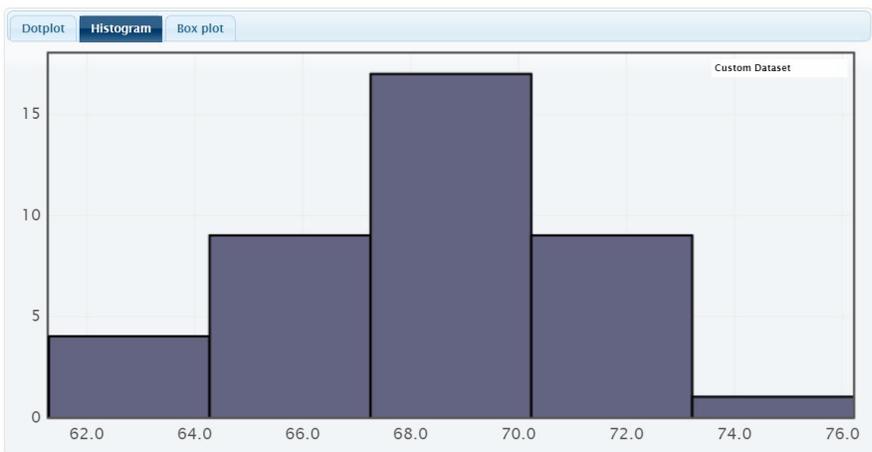
Notes

Normally Distributed: Quantitative data sets all have a unique shape. A quantitative data set has a normal shape (or normally distributed) if the graph looks like a bell with most of the data in the middle and symmetric left and right tails. When data is normal, often the mean and median averages are pretty close. If the mean is significantly bigger or smaller than the median, that usually means it is not normally distributed data.

Dot Plot: This graph puts a dot on the number line for each number in the quantitative data set. If the dot plot is normally distributed (bell shaped), you should see most of the dots in the center and fewer and fewer dots as you go away from the center. The right and left tails should be about the same length.

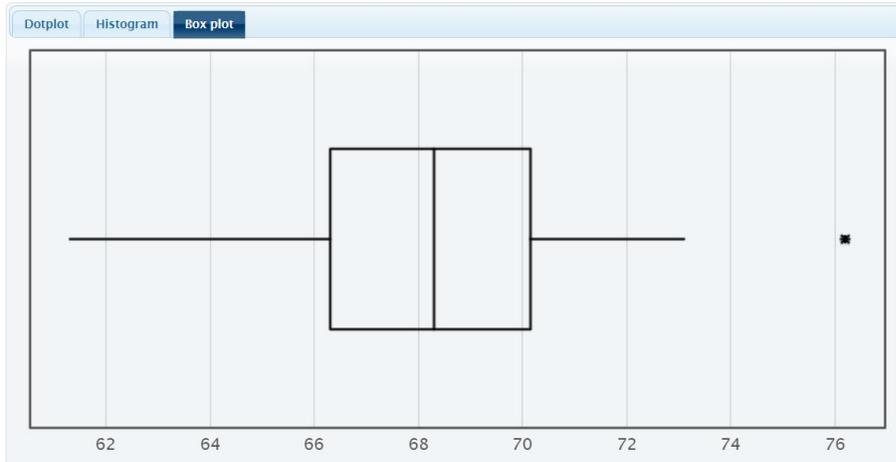


Histogram: This graph makes bars to show how many numbers are in each section of the quantitative data. A histogram looks normally distributed (bell shaped), if the highest bar is in the middle and the bars decrease in height as you go away from the middle. Also, the left and right tails should be symmetric.



Stat Support Activity: Normally Distributed

Box Plot: A box plot (or box and whisker plot) is a graph of quartiles and is usually used with non-normal data. However, we can still see if a quantitative data set is normally distributed (bell shaped) from the Box Plot. The center is the line inside the box. If the data is normally distributed, the distance from the line in the box (center) to the highest number in the data (right tail) will be about the same distance as the line in the box (center) to the lowest number in the data (left tail). Also, the box is not overly long.



Creating Dot Plots, Histograms and Box Plots with StatKey

- Go to www.lock5stat.com, and click on “One Quantitative Variable”.
- Click on the “Edit Data” button.
- Delete out old data in the edit data screen by pushing holding the “control” or “command” key down on your keyboard and press “A”. This will highlight the old data. Then press “Delete” on your keyboard.
- Open your data and copy the column of quantitative data. Now past your column of data into the edit data screen.
- Uncheck the box that says “Identifier”. Do not check this box.
- If your data has a title, check the box that says “Header Row”.
- Then press the “OK” button.
- At the top of the graph screen you can go from “dot plot” to “histogram” to “box plot”.
- For histograms, it is good to move the slider back and forth until you see the normal shape. In general, the smaller the data set, the less bars (buckets) you want. Five bars (buckets) usually works pretty well.

Stat Support Activity: Normally Distributed

Problems

1.

Go to www.matt-teachout.org and click on the “data sets” menu. Open the “Health Data”. Copy column “AA” that says “Female Wrist Circumference”. Go to www.lock5stat.com, click on “StatKey” and then “One Quantitative Variable”. Past the female wrist circumference data into the “Edit data” menu. Remember not to check “identifier” but do check “header row” before pressing “OK”.

Look at the dot plot, histogram and box plot for this data. For the histogram, move the slider back and forth until you have 5 bars in your histogram (“5 buckets”).

Do all three graphs show the data is normally distributed (bell shaped)?

Look at the summary statistics on the right. Are the mean and median averages pretty close?

Draw small rough quick sketches of the dot plot, histogram with 5 bars, and the box plot.

2.

Go to www.matt-teachout.org and click on the “data sets” menu. Open the “Health Data”. Copy column “AE” that says “Male Height”. Go to www.lock5stat.com, click on “StatKey” and then “One Quantitative Variable”. Past the male height data into the “Edit data” menu. Remember not to check “identifier” but do check “header row” before pressing “OK”.

Look at the dot plot, histogram and box plot for this data. For the histogram, move the slider back and forth until you have 5 bars in your histogram (“5 buckets”).

Do all three graphs show the data is normally distributed (bell shaped)?

Look at the summary statistics on the right. Are the mean and median averages pretty close?

Draw small rough quick sketches of the dot plot, histogram with 5 bars, and the box plot.

3.

Go to www.matt-teachout.org and click on the “data sets” menu. Open the “Health Data”. Copy column “V” that says “Female Diastolic Blood Pressure”. Go to www.lock5stat.com, click on “StatKey” and then “One Quantitative Variable”. Past the female diastolic blood pressure into the “Edit data” menu. Remember not to check “identifier” but do check “header row” before pressing “OK”.

Look at the dot plot, histogram and box plot for this data. For the histogram, move the slider back and forth until you have 6 bars in your histogram (“6 buckets”).

Look at the summary statistics on the right. Are the mean and median averages pretty close?

Do all three graphs show the data is nearly normal? (They are not perfectly bell shaped, but are close to bell shaped.)

Draw small rough quick sketches of the dot plot, histogram with 6 bars, and the box plot.